A New Species of *Solanum* (Solanaceae) from the Highlands of Central Brazil

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Abstract. A new species of *Solanum* L. belonging to subgenus *Leptostemonum* (Dunal) Bitter section *Acanthophora* Dunal (Solanaceae) is described and illustrated from the Distrito Federal in central Brazil. *Solanum savannarum* Ribeiro-Silva & Proença is a small, spindly herb or subshrub with spiny stems and petioles, weakly lobed leaves, pentamerous or tetramerous nodding white flowers with revolute sepals and petals, green attenuate anthers, pale green fruits mottled with dark green, each with ca. 11 seeds. The species is apparently endemic to highland savanna woodlands (cerrado) in the Brazilian states of the Distrito Federal, Goiás, and western Minas Gerais.

Resumo. Uma nova espécie de *Solanum* L., pertencente ao subgênero *Leptostemonum* (Dunal) Bitter seção *Acanthophora* Dunal (Solanaceae) é descrita e ilustrada. *Solanum savannarum* Ribeiro-Silva & Proença é uma pequena erva ou subarbusto com ramos e pecíolos aculeados, folhas fracamente lobadas, flores pentâmeras ou tetrâmeras, pêndulas, brancas, com sépalas e pétalas revolutas, anteras verdes, atenuadas, e frutos verde pálidos manchados de verde escuro com ca. 11 sementes. A espécie é aparentemente endêmica a cerrados de altitude do Distrito Federal, Goiás e oeste de Minas Gerais no Brasil Central.

Key words: Brazil, cerrado, IUCN Red List, savanna, section *Acanthophora*, *Solanum*, South America.

The cerrado biome, which covers ca. 2.4 million km² and 25% of Brazil's area, is the second largest biogeographic region in South America, after the Amazon rainforest. A species-rich, diverse savanna (Klink & Machado, 2005), the cerrado biome extends over virtually the entire states of Goiás, Tocantins, and the Distrito Federal, and extends into large areas of the states of Bahia, Ceará, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Piauí, Rondônia, and São Paulo (Ribeiro & Walter, 1998).

The genus *Solanum* L. (Solanaceae), with approximately 1400 species, is most diverse in South America, particularly in the Andes and on the Pacific coast (Hunziker, 2001). Based on morphological characters, seven *Solanum* subgenera are recognized in recent taxonomic classifications (D'Arcy, 1972, 1991), while chloroplast *ndhF* sequences have been used to identify 13 clades within the genus (Bohs, 2005; Weese & Bohs, 2007).

The present proposal is based on more than a decade of collecting, field observations, and study of herbarium material in the Distrito Federal and Goiás by the authors. The last collection made (*Proença et al. 3600* [UB]) was important to understand the distribution of the species. Our initial study, a floristic account of the genus *Solanum* in the Distrito Federal, Brazil, began in 1994. We recognized 22 species of *Solanum* in the Distrito Federal (Ribeiro-Silva, 1996), where the new species remained unidentified as *Solanum* sp. 2. Further study of the literature, and several additional collections, made it clear that *Solanum* sp. 2 is in fact a new species of subgenus *Leptostemonum* (Dunal) Bitter section *Acanthophora* Dunal, and is apparently restricted to woodland savanna vegetation in the Distrito Federal, Minas Gerais, and Goiás. Several specimens of this species are identified in NY as *S. foederale* M. Nee, a name that, as far as we are aware, has never been published. Given that this species is also relatively well-distributed in the Goiás highlands, as well as in the Distrito Federal and Minas Gerais, the epithet *foederale* no longer seems appropriate.

Solanum savannarum Ribeiro-Silva & Proença, sp. nov. TYPE: Brazil. Distrito Federal: Parque de Uso Múltiplo das Sucupiras, Setor Sudoeste,

15°47′S, 47°55″W, 960–1150 m, Nov. 2005, *F. B. Passos & C. Proença 77* (holotype, UB). Figure 1.

Haec species quoad aspectum pubescentiam habitumque *Solano tenuissimo* Sendt similis, sed ab eo antheris viridibus, fructu ovoideo majore atque seminibus pluribus (ca. 11) distinguitur.

Herb or subshrub, ca. 20–30 cm tall, armed; spines acicular, ca. 0.1–0.3 cm; stems terete, aculeate, with sparse to almost dense ferruginous indumentum composed of both glandular and non-glandular, 1-celled trichomes. *Lamina* 1.8–7.8 × 0.5–5 cm, solitary, concolorous, ovate-lanceolate, rough; apex acute to acuminate; base acute to rounded, sometimes asymmetrical; margin entire to slightly lobed; upper surface puberulous with simple, rarely stellate trichomes; lower surface with sparse, scabrid indumentum with rare glandular trichomes, these with the apical portion either 1-celled or multi-celled, the non-glandular trichomes many-celled, and many trichomes porrect-stellate, sessile or short-peduncu-late, with 2 to 4 radial cells and 1 short, central cell; midvein and laterals aculeate; petiole 0.2–1.1 cm, aculeate, with both glandular and non-glandular, 1-celled trichomes. *Cymes* umbelliform, extra-axillary, with ca. 5 flowers, peduncles ca. 0.3 cm, with non-glandular, 1-celled trichomes; pedicels 0.5–1.6 cm, with glandular, eglandular and stellate trichomes. Flowers with the calyx ca. 1 cm diam., externally with sparse glandular trichomes, non-glandular trichomes, and many stellate trichomes; calyx lobes ca. 0.4 cm, narrowly deltoid, persistent, and slightly accrescent in the fruit; corolla ca. 2 cm diam., all pentamerous or some flowers tetramerous, white with margins sometimes pale lilac, externally with 1-celled trichomes; corolla lobes ca. 1 cm, ovate-lanceolate; filaments ca. 0.2 cm, glabrous; anthers ca. 0.6 cm, green, attenuate, glabrous; ovary ca. 1 mm diam., ovoid, glabrous; style erect, ca. 8 mm, glabrous; stigma above the anthers. *Berry* ca. 1.5–2 cm diam., green-striate, ovoid to spheroid, glabrous, with ca. 11 seeds; peduncle in the fruit very short; *seeds* ca. 2 mm diam., light chestnut in color.

Distribution, ecology, and phenology. *Solanum savannarum* is distributed through highland areas of the Brazilian Shield, in Goiás, Minas Gerais, and the Distrito Federal, Brazil, ranging between ca. 14° and 18°S and between 48° and 53°W. Within this area, the taxon is probably restricted to areas above 1000 m. In the state of Goiás, *S. savannarum* is known from the Serra dos Cristais, Cristalina; Chapada dos Veadeiros, Alto Paraíso de Goiás; São João da Aliança; Serra de Catalão, Catalão; and Serra dos Caiapós, south of Caiapônia. In the Distrito Federal it occurs in several disturbed cerrado sites above 1000 m. There is some evidence that this species flowers after burning, which may be why it has persisted in disturbed cerrado areas in the Distrito Federal; these areas burn more frequently than well-preserved areas. Flowering was noted to occur from October to March and fruiting from November to April.

IUCN Red List category. According to IUCN Red List criteria (IUCN, 2001), *Solanum savannarum* should be regarded as Least Concern (LC). Nine populations are known across a relatively wide geographic range, within a habitat probably exceeding 20,000 km², although this habitat has suffered continuous reduction in size and quality (Klink & Machado, 2005).

Discussion. *Solanum savannarum* shows affinities with subgenus *Leptostemonum* (Dunal) Bitter, a group commonly known as the spiny solanums, due to their epidermal thorns, stellate trichomes, and attenuate anthers. *Solanum* subg. *Leptostemonum* is the second largest subgenus, with ca. 450 species (Whalen, 1984; Nee, 1999) with a worldwide distribution. The main center of diversity for this subgenus is within South America, followed by Australia and Africa (Whalen, 1984; D'Arcy, 1991; Symon, 1991). In Brazil this is the second most species-rich subgenus in *Solanum*, with approximately 110 species distributed across 10 sections. In the Distrito Federal, *Solanum* subg. *Leptostemonum* is the most species-rich with 16 species (Ribeiro-Silva, 1996) including this new taxon. Within subgenus *Leptostemonum*, the presence of simple trichomes on the upper leaf surface combined with stellate trichomes on the lower surface, and general appearance, would position *S. savannarum* within section *Acanthophora* Dunal, which is the largest section in Brazil, with ca. 22 species (Nee, 1991; Agra, 2007).

Solanum savannarum could be confused with *S. tenuissimum* Sendtn. due to its general aspect, pubescence, and habit. The latter species also occurs in central Brazil, in the state of Goiás, although the taxon was not found in the Distrito Federal, even after intensive collecting (Ribeiro-Silva et al., 1996). *Solanum tenuissimum*, however, can be distinguished by its yellow anthers, and the globose, smaller fruits (to ca. 0.4 cm in diameter) with at most three seeds per fruit; *S. savannarum* is distinguishable by its green anthers and the ovoid, larger fruits that present more seeds per fruit (ca. 11).

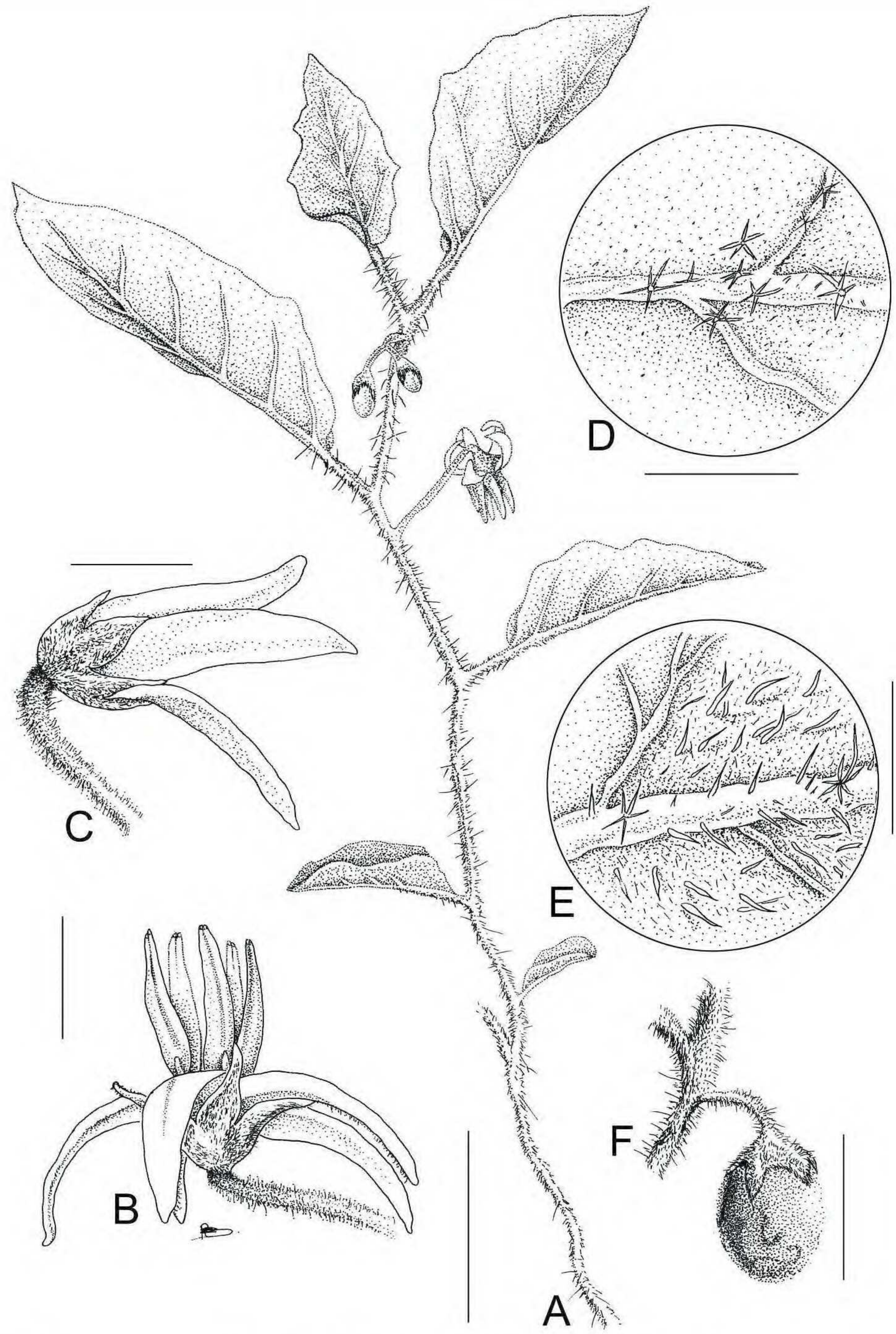

Figure 1. *Solanum savannarum* Ribeiro-Silva & Proença. —A. Habit. —B. Open flower showing attenuate anthers. —C. Closed flower. —D. Detail of lower leaf surface. —E. Detail of upper leaf surface. —F. Fruit. Scales: A = 5 cm; B, C = 5 mm; D, E = 0.15 mm; F = 2 cm.

Paratypes. BRAZIL. **Distrito Federal:** Barragem do Rio São Bartolomeu, Nov. 1973, *E. P. Heringer 12995* (NY, UB); betw. Brasília & Sobradinho, Oct. 1965, *H. S. Irwin, R. Souza & R. Reis dos Santos 9169* (NY); Brasília, *H. S. Irwin et al. 10273* (NY); estrada para Planaltina, ca. 25 km W of Brasília, Oct. 1965, *H. S. Irwin R. Souza & R. Reis dos Santos 9521* (NY, UB); Gama, Nov. 1976, *A. Allem 331* (CEN); Horto do Guará, Jan. 1961, *E. P. Heringer 7852*

(UB); s. loc., Mar. 1959, *E. P. Heringer 6705* (UB); Jardim Botânico de Brasília, Oct. 1986, *C. Proença 650* (HEPH); campo após a área de lazer 31 Jan. 2008, *R. G. Chacon, R. Correa & A. G. Amaral 260* (HEPH); Reserva Ecológica do IBGE, Nov. 1983, *B. A. S. Pereira 873* (IBGE, NY), cerrado nearby greenhouse, Feb. 1995, *S. R. Silva 52* (NY, UB), Jan. 1981, *F. C. Silva 428* (IBGE); Sede do IBDF, Apr. 1976, *E. P. Heringer 15519* (UB), Córrego Taquara, Oct. 1999, *M. Fonseca & D. Alvarenga 2192* (IBGE, NY, UB). **Goiás:** São João da Aliança, 3 km NE of São João da Aliança, Mar. 1973, *W. R. Anderson et al. 7730* (NY, UB); Cristalina, Nov. 2008, *C. Proença, F. B. Passos & R. G. Chacon 3600* (UB); Chapada dos Veadeiros, Feb. 1966, *H. S. Irwin et al. 12844* (NY); ca. 58 km NE de Catalão, 26 Jan. 1970, *H. S. Irwin et al. 25451* (NY); Serra do Caiapó, ca. 60 km S of Caiapônia, rd. to Jataí, Nov. 1964, *H. S. Irwin & T. R. Soderstrom 7565* (NY). **Minas Gerais:** Serra do Rio Preto, ca. 5 km E of Goiás, rd. to Guarapuava, Nov. 1965, *H. S. Irwin, R. Souza & R. Reis dos Santos 10279* (NY).

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